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LISTS OF SPECIES

Amphibia, Anura, restinga of Baixada do Maciambu, municipality of Palhoça, state of Santa Catarina, southern Brazil

Milena Wachlevski * and Carlos Frederico Duarte Rocha

Universidade do Estado do Rio de Janeiro, Departamento de Ecologia. Rua São Francisco Xavier, 524. CEP 20550-019. Rio de Janeiro, RJ, Brazil.
* Corresponding author. E-mail: *milenawm@yahoo.com*

ABSTRACT: Little is known about amphibian communities on Brazilian restingas (coastal sand dune scrublands). This study presents a first approximation to the list of anuran species from the restinga of Baixada do Maciambu, Santa Catarina, southern Brazil. We sampled using three methods (pitfall traps with drift fences, transect of active search, and surveys at breeding sites) from July 2007 to April 2010. We recorded 15 species in six families, of which Hylidae was represented by the greatest number of species. Compared to other Brazilian restinga habitats, the species richness we recorded at the Baixada do Maciambu is similar to that reported for restingas of Rio de Janeiro state, but lower than that reported for restingas in São Paulo, Rio Grande do Sul and Bahia states, Brazil.

INTRODUCTION

The Restingas are coastal strips in Atlantic forest, located in coastal lowlands, formed by string of beaches and sands dunes covered by herbaceous and arbustive-arboreal vegetation (Araújo 1992). Because the restingas (coastal sand dune scrublands) are located along the Brazilian coast they tend to be under intense anthropic pressure, thus having the original landscape considerably modified in most areas (Rocha *et al.* 2004; Rocha and Van Sluys 2007). Compared with other habitats in the Atlantic forest, as ombrophilous dense forest (*e.g.* Heyer *et al.* 1990), relatively little is known about the composition and functioning of populations and communities of amphibians in restinga habitats (Van Sluys *et al.* 2004). A compilation of data on frogs occurring in the eastern Brazilian restingas recorded 52 species from Bahia to Santa Catarina, but did not specify the areas where many of the species were recorded along the Brazilian coast (Carvalho-e-Silva *et al.* 2000). The more we accumulate data on local species richness in restinga habitats the more we will be able to understand the rate of change in richness among areas (Beta diversity) and the regional diversity (Gamma diversity) for those environments.

In this study, we present a first approximation to the richness of anuran species at the restinga of Baixada do Maciambu, Santa Catarina, Southern Brazil.

MATERIALS AND METHODS

Study site

This study was conducted at the restinga of Baixada do Maciambu (27°49'34" - 27°49'39" S, 48°36'59" - 48°37'27" W), within the Parque Estadual da Serra do Tabuleiro, municipality of Palhoça, state of Santa Catarina, Brazil. The climate is Cfa type according Köppen, humid mesothermal with warm summer, with annual mean rainfall around 1200 mm and annual mean temperature 20.5 °C, with mean 16.3 °C in coolest month (July) and 24.6 °C in warmest month, (January) (CECCA 1997).

Sampling methods

We sampled anurans every three months from July 2007 to April 2010, with sampling made during five days per month. In order to obtain a representative dataset of the anuran species for the study area we used three complementary sampling methods: pitfall traps with drift fence (see Cechin and Martins 2000), time-constrained active search transects (see Jaeger 1994), and surveys at breeding sites (see Scott Jr. and Woodward 1994). Some anurans were captured during occasional encounters, and those records were also considered.

One system of pitfall traps were installed in open, bush, and restinga forest areas, totaling three systems. In each system the traps were arranged in two 100 m-long lines of ten buckets (65 liters) and three Y-shape were arranged, with a bucket in the center and one at each end, totaling 96 buckets installed, 32 buckets on each system. The pitfalls were checked once per day (always in the morning) for five consecutive days at each sampling.

For active search transects, we performed 514 transects of 30 minutes duration each, totaling 257 hours of sampling effort, distributed between open, bush, and restinga forest areas. Of these transect searches, 189 were diurnal (94.5 hours), 106 crepuscular (53 hours), and 219 nocturnal (109.5 hours). For surveys at breeding sites, seven breeding sites were searched, four temporary and three permanent ponds. Specimens were collected under collecting permit number 1448 SISBIO/Instituto Chico Mendes and FATMA (Fundação Do Meio Ambiente de Santa Catarina).

RESULTS AND DISCUSSION

We recorded 15 species in ten genera and six families of anurans (Table 1; Figures 1-2) for the restinga of Baixada do Maciambu. Most frog species occurred in more than one mesohabitat sampled, but *Odontophrynus maisuma e Sphaenorhynchus caramaschii* occurred only in open area, *Hypsiboas faber* occurred only in forested

area and *H. albomarginatus* occurred only in shrub area (Table 1). The richness of frog species recorded in the present study for Baixada do Maciambu is similar when compared to preliminary species lists for the restingas of Maricá (14 species) (Britto-Pereira *et al.* 1988), Jurubatiba (10 species) (Van Sluys *et al.* 2004) and Marambaia (12 species, considered only for restinga area) (Silva *et al.* 2008), all in the state of Rio de Janeiro. The total species richness recorded in a study comparing ten different restinga habitats in the states of Rio de Janeiro, Espírito Santo, and Bahia was 28, but considering the number of species recorded for each locality, the one with the highest richness was Praia das Neves, in the state of Espírito Santo, with 13 species (Rocha *et al.* 2008). The greatest number of frog species recorded in restingas until now was reported from Mata São João in the state of Bahia, with 30 species (Bastazini *et al.* 2007), followed by Parque Estadual de Itapeva, in the state of Rio Grande do Sul, with 28 species (Colombo *et al.* 2008) and, the Juréia-Itatins Ecological Station, state of São Paulo, with 20 species (Narvaes *et al.* 2009).

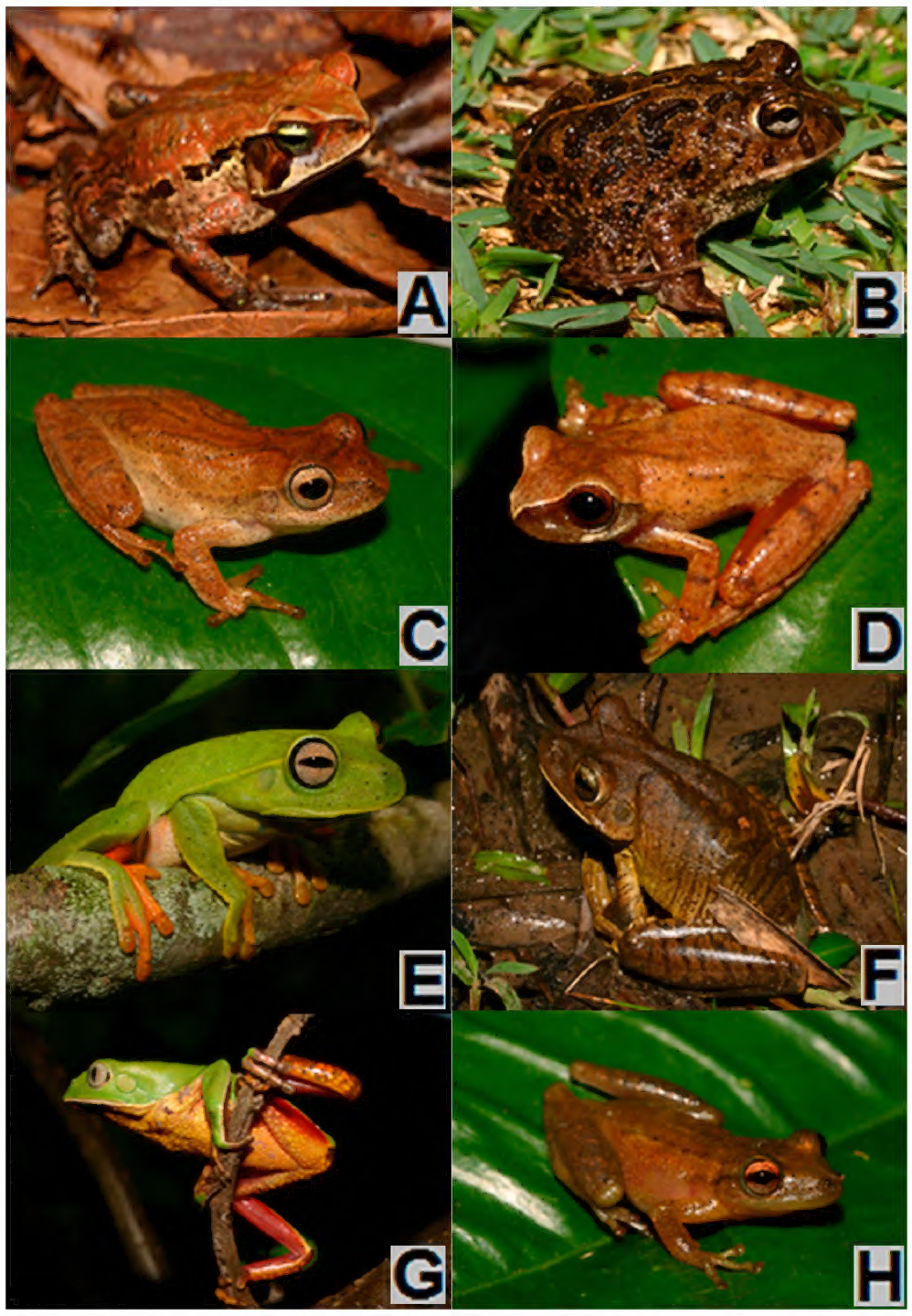

Figure 1. Species of amphibian anurans from the restinga of Baixada do Maciambu, state of Santa Catarina, Brazil: (A) *Rhinella abei*, (B) *Odontophrynus maisuma*, (C) *Dendropsophus minutus*, (D) *Dendropsophus werneri*, (E) *Hypsiboas albomarginatus*, (F) *Hypsiboas faber*, (G) *Phyllomedusa distincta*, (H) *Scinax* aff. *alter*.

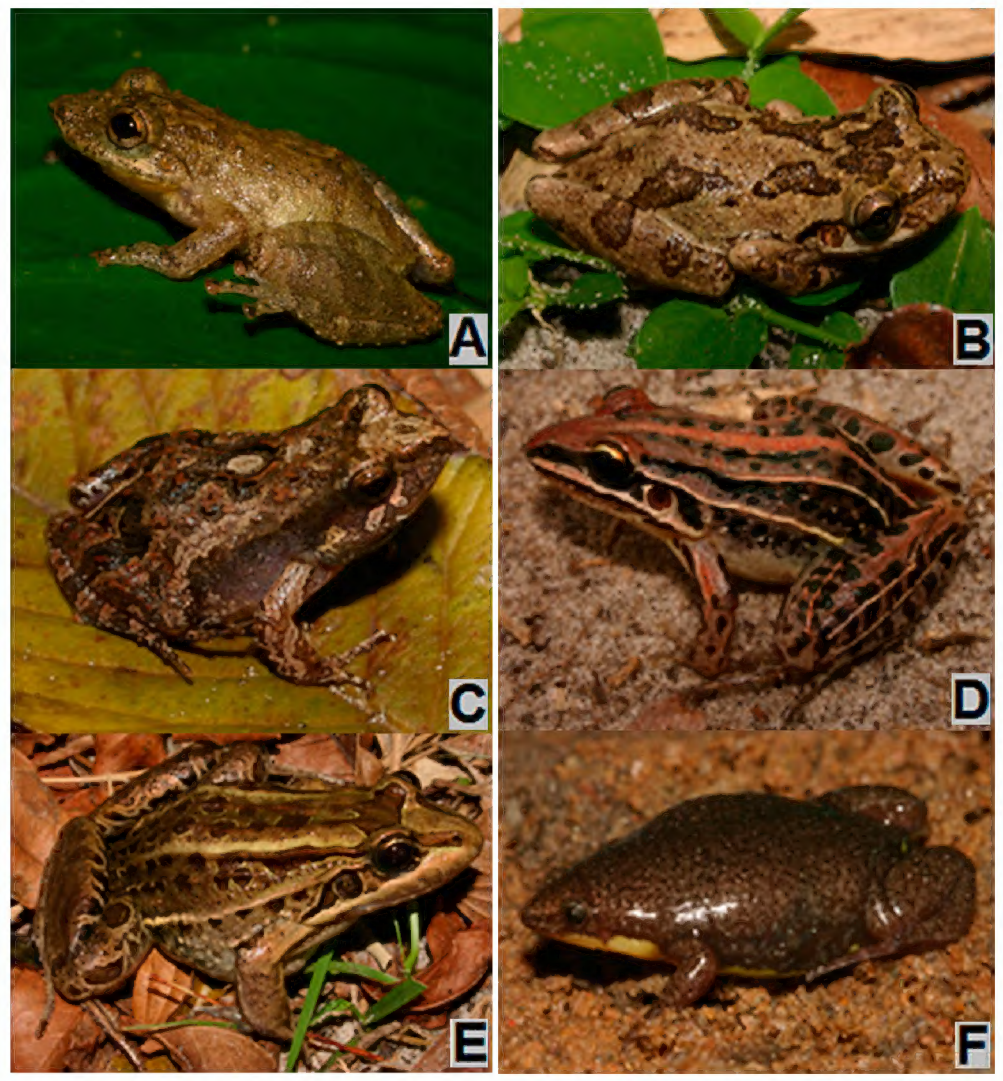

Figure 2. Species of amphibian anurans from the restinga of Baixada do Maciambu, state of Santa Catarina, Brazil: (A) *Scinax argyreornatus*, (B) *Scinax granulatus*, (C) *Physalaemus cuvieri*, (D) *Leptodactylus gracilis*, (E) *Leptodactylus latrans*, (F) *Elachistocleis bicolor*.

Table 1. Anuran species recorded in the restinga of Baixada do Maciambu, municipality of Palhoça, state of Santa Catarina, Brazil, in each area (O = open area, B=bush area and F=forest area).

Taxon	Habitats
Bufonidae	
Rhinella abei (Baldissera-Jr, Caramaschi and Haddad, 2004)	O, B, F
Cyclorhamphidae	
Odontophrynus maisuma Rosset, 2008	O
Hylidae	
Dendropsophus minutus (Peters, 1872)	O, B
Dendropsophus werneri (Cochran, 1952)	O, B
Hypsiboas albomarginatus (Spix, 1824)	B
Hypsiboas faber (Wied-Neuwied, 1821)	F
Phyllomedusa distincta A. Lutz in B. Lutz, 1950	B, F
Scinax aff. *alter*	O, B, F
Scinax argyreornatus (Miranda-Ribeiro, 1926)	O, F
Scinax granulatus (Peters, 1871)	O, B, F
Sphaenorhynchus caramaschii Toledo, Garcia, Lingnau and Haddad, 2007	O
Leiuperidae	
Physalaemus cuvieri Fitzinger, 1826	O, B, F
Leptodactylidae	
Leptodactylus gracilis (Duméril and Bibron, 1841)	O, B, F
Leptodactylus latrans (Steffen, 1815)	O, B, F
Microhylidae	
Elachistocleis bicolor (Valenciennes *in* Guérin-Menéville, 1838)	O, B

In terms of species richness, the family Hylidae was the most representative in the restinga of Baixada do Maciambu (Table 1), as well as in other restinga environments in Brazil (Rocha *et al.* 2007; Bastazini *et al.* 2007; Colombo *et al.* 2008; Silva *et al.* 2008; Narvaes *et al.* 2009). Carvalho-e-Silva *et al.* (2000) listed 52 frog species occurring in restingas of eastern Brazil; here we add to their list the species *Dendropsophus werneri* (Figure 1D), *Elachistocleis bicolor* (Figure 2F), *Leptodactylus gracilis* (Figure 2D), *Odontophrynus maisuma* (Figure 1B), *Physalaemus cuvieri* (Figure 2C), *Phyllomedusa distincta* (figure 1G), *Scinax granulatus* (Figure 2B), and *Sphaenorhynchus caramaschii*, recorded by us at the Baixada do Maciambu.

Usually the anuran species recorded in restingas have a wide geographic distribution and tend to also occur in other types of habitat (Van Sluys *et al.* 2004), although the composition of anuran species tend to vary among the restingas along the Brazilian coast (Rocha *et al.* 2008). The increasing degradation of those habitats may be reducing the available environments for the maintenance of these species (Rocha *et al.* 2004).

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